



7-14-04

JW

AF/3729
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

John W. Ladd

Serial No.: 10/044,743

Filed: January 11, 2002

For: APPARATUS FOR ESTABLISHING
AN ELECTRICAL CONNECTION WITH A
WAFER TO FACILITATE WAFER-LEVEL
BURN-IN AND METHODS

Confirmation No.: 3846

Examiner: R. Chang

Group Art Unit: 3729

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APPEAL BRIEF

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P.O. Box 1450
Alexandria, VA 22313-1450

Attn: Board of Patent Appeals and Interferences

Sirs:

This Appeal Brief is submitted in triplicate and in the format of 37 C.F.R. § 1.192(c). A check in the amount of \$330.00 for the fee under 37 C.F.R § 1.17(c) for filing a brief in support of an appeal is enclosed.

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This Appeal Brief is being filed with a petition for a one-month extension of time and the appropriate fee.

(1) REAL PARTY IN INTEREST

The real party in interest in the present pending appeal is Micron Technology, Inc., the assignee of the above-referenced application as recorded with the United States Patent and Trademark Office on June 22, 1998, Reel 011543, Frame 0511.

(2) RELATED APPEALS AND INTERFERENCES

Applicants are not aware of any related applications that are on appeal or subject to other proceedings before the Board of Patent Appeals and Interferences that would influence or affect the Board's decision in the above-referenced appeal.

(3) STATUS OF THE CLAIMS

Claims 1-20 are pending in the above-referenced application. Of these, claims 1-9 and 11-20 remain under consideration, claim 10 having been withdrawn from consideration pursuant to a species election requirement.

Each of claims 1-9 and 11-20 stands rejected.

The rejections of claims 1-9 and 11-20 are being appealed.

(4) STATUS OF AMENDMENTS

The above-referenced application, U.S. Patent application serial no. 10/044,743 (hereinafter “the ‘743 Application”), was filed as a continuation of of U.S. Patent application serial no. 09/777,986 on January 11, 2002. The ‘743 Application was originally filed with 20 claims.

A species election requirement was mailed on April 23, 2003, and responded to in a communication filed on May 6, 2003.

A first Office Action on the merits was mailed by the Office on July 25, 2003. The first Office Action indicated that claim 10 had been withdrawn from consideration, but noted that “[i]f independent claim 8 is allowed, [withdrawn] claim 10 will be rejoined.” Office Action dated July 25, 2003, page 2. Each of claims 1-9 and 11-20 was rejected.

An Amendment, in response to the first Office Action, was submitted on October 27, 2003, and received a filing date of October 30, 2003. Revisions to the title and the abstract were presented in the Amendment of October 30, 2003, as were formal revisions to claims 1-9 and 11-20. No further revisions to these claims were presented.

A Final Office Action was mailed by the Office on January 14, 2004. Claims 1-9 and 11-20 were again rejected.

In an Amendment Under 37 C.F.R. § 1.116 filed March 18, 2004, further revisions to the abstract were presented, as was an amendment to withdraw claim 10 to change the form thereof.

An Advisory Action followed on April 7, 2004, maintaining the rejections of claims 1-9 and 11-20. The Advisory Action did not indicate whether the amendments to the abstract or claim 10 have been entered.

On April 13, 2004, a Notice of Appeal was filed, and is followed by this Appeal Brief, which is accompanied by a petition for a one month extension of time and the appropriate fee.

(5) SUMMARY OF THE INVENTION

The '743 Application describes and claims a method for establishing electrical contact with at least one semiconductor device. Paragraph [0011]. The electrical contact is established by drawing a member of an electrical connector toward a contact of the semiconductor device. Paragraphs [0012] and [0013]. Alternatively, two members of the electrical connector may be positioned on opposite sides of the semiconductor device, with one of the members being positioned against the contact. *Id.* One of the two members of the electrical connector may be drawn toward the other, or they may both be drawn toward each other. *Id.* Magnetic forces may be used to draw a member of an electrical connector toward the contact or to draw one member of an electrical connector toward another member of the electrical connector. *Id.*

This method for establishing electrical contact may be used in stress testing semiconductor devices, including stress testing methods in which multiple devices are simultaneously stressed. Paragraphs [0011] and [0014].

(6) ISSUES

(A) Whether claims 1-20 are allowable under 35 U.S.C. § 101 for reciting subject matter which is not identical to the subject matter recited in claims 1-20 of copending U.S. Patent application serial no. 10/035,738 (hereinafter “the ‘738 Application”);

(B) Whether, under 35 U.S.C. § 102(b), claims 1-7 are allowable for being directed to subject matter which is not anticipated by the disclosure of U.S. Patent 3,612,955 to Butherus et al. (hereinafter “Butherus”); and

(C) Whether claims 8, 9, and 11-20 are directed to subject matter that, under 35 U.S.C. § 103(a), is patentable over the subject matter taught in Butherus in view of “official notice” that has been taken by the Examiner.

(7) GROUPING OF CLAIMS

Group 1 – Claims 1-7:

With respect to the 35 U.S.C. § 101 rejection, claims 1-7 should be grouped together. Claim 1 is the most generic claim of this group. Claims 2-7 stand and fall with claim 1.

Group 2 – Claims 8-20:

Also with respect to the 35 U.S.C. § 101 rejection, claims 8-20 should be grouped together. Claim 8 is the most generic claim of this group. Claims 9-20 stand and fall with claim 8.

Group 3 – Claims 1-7:

As for the 35 U.S.C. § 102(b) rejection, claims 1-7 should be grouped together, claim 1 being the most generic claim of this group. Claims 2-7 stand with claim 1, but, for reasons set forth in the ensuing “ARGUMENT” section of this Appeal Brief, claims 4-6 do not fall with claim 1.

Group 4 – Claims 8, 9, and 11-20:

In considering the propriety of the 35 U.S.C. § 103(a) rejection of claims 8, 9, and 11-20, each of these claims should be grouped together, claim 8 being the most generic. Claims 9 and 11-20 stand with claim 8 but, as set forth hereinafter, none of claims 11 or 13-15 falls with claim 8.

(8) ARGUMENT

(A) Rejections Under 35 U.S.C. § 101

Claims 1-20 stand rejected under 35 U.S.C. § 101 for reciting identical subject matter to that recited in claims 1-20 of the ‘738 Application.

(1) Legal Authority

35 U.S.C. § 101 provides in relevant part: “Whoever invents or discovers any new and useful process . . . may obtain a patent therefor . . .” (emphasis added). In explaining the basis

on which a double patenting rejection under 35 U.S.C. § 101 should be premised, M.P.E.P.

§ 804(II)(A) provides:

In determining whether a statutory basis for a double patenting rejection exists, the question to be asked is: Is the same invention being claimed twice?

. . . Is there an embodiment of the invention that falls within the scope of one claim, but not the other? If there is such an embodiment, then identical subject matter is not defined by both claims and statutory double patenting would not exist.

(2) Analysis

Claims 1-7

Independent claim 1 of the '743 Application is drawn to a method for establishing an electrical contact with at least one semiconductor device. The method of independent claim 1 includes "establishing an electrical contact between a first member of an electrical connector and a contact that is in electrical communication with the at least one semiconductor device," as well as "drawing the first member toward the contact." In contrast, independent claim 1 of the '738 Application includes additional limitations and, thus, may not be infringed by some embodiments of a process that would infringe independent claim 1 of the '743 Application. In particular, independent claim 1 of the '738 Application is directed to a method for establishing *temporary* electrical contact, a limitation which is not present in independent claim 1 of the '743 Application.

Also, independent claim 1 of the '743 Application recites that the first member is drawn toward the contact, without further limiting the act of "drawing." Independent claim 1 of

the '738 Application, in contrast, recites "magnetically drawing," additionally requiring that the drawing be effected by magnetic means.

Independent claim 1 of the '743 Application also lacks a limitation that appears in independent claim 1 of the '738 Application. Specifically, independent claim 1 of the '743 Application does not recite "permitting an electrical current to flow from at least one of the electrical connector and the contact to the other of the contact and the electrical connector as the temporary electrical contact is maintained."

Further, neither claim 5 nor claim 7 of the '743 Application (or any of claims 2-4 or 6 of the '743 Application) includes *all* of these additional limitations.

It is, therefore, respectfully submitted that none of claims 1, 5, or 7 of the '743 Application recites subject matter which is identical to that of independent claim 1 of the '738 Application. Accordingly, under 35 U.S.C. § 101, claims 1, 5, and 7 of the '743 Application are allowable over independent claim 1 of the '738 Application.

Each of claims 2-4 and 6 is allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claims 8-20

Independent claim 8 of the '743 Application is directed to a method for stress testing a plurality of semiconductor devices carried upon a common substrate. The method of independent claim 8 includes "establishing electrical contact between a first member of an electrical connector and at least one contact of [a common] ground contact and [a common]

power contact” of the common substrate. Additionally, the method of independent claim 8 includes “drawing the first member toward the at least one contact.”

Independent claim 8 of the ‘738 Application includes additional limitations and, thus, may not be infringed by some embodiments of a process that would infringe independent claim 1 of the ‘743 Application.

In particular, independent claim 8 of the ‘738 Application is directed to a method for establishing *temporary* electrical contact, a limitation which is not present in independent claim 8 of the ‘743 Application.

Also, independent claim 8 of the ‘743 Application merely recites “drawing” one of a contact and an electrical connector toward the other, while independent claim 8 of the ‘738 Application additionally requires that such drawing be “magnetically” effected.

Independent claim 8 of the ‘743 Application also lacks the requirement of independent claim 8 of the ‘738 Application that “an electrical current [be permitted] to flow from at least one of the electrical connector and the contact to the other of the contact and the electrical connector as the temporary electrical contact is maintained.”

Further, neither claim 13 nor claim 14 of the ‘743 Application, which include the act of “magnetically drawing,” requires that only a temporary electrical contact be established or “permitting an electrical current to flow from at least one of the electrical connector and the contact to the other of the contact and the electrical connector as the temporary electrical contact is maintained,” as are required by independent claim 8 of the ‘738 Application.

It is, therefore, respectfully submitted that none of claims 8, 13, or 14 of the '743 Application (or any claims 9-12 or 15-20) recites subject matter which is identical to that of independent claim 8 of the '738 Application. Accordingly, under 35 U.S.C. § 101, claims 8, 13, and 14 of the '743 Application are allowable over independent claim 8 of the '738 Application.

Claims 9-12 and 15-20 are each allowable, among other reasons, for depending either directly or indirectly from claim 8, which is allowable.

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 101 rejections of claims 1-20 be reversed.

(B) Rejections Under 35 U.S.C. § 102(b)

Claims 1-7 stand rejected under 35 U.S.C. § 102(b) for reciting subject matter which is purportedly anticipated by that described in Butherus.

(1) Legal Authority

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

(2) Art Relied Upon

Butherus

Butherus describes a circuit board that includes magnetized traces and a packaged semiconductor device that includes leads that are either magnetized or formed from a material which is attracted to the source of a magnetic field. Col. 2, lines 59-75. The traces and leads are magnetized in such a way that, with rough alignment of the packaged semiconductor device over the circuit board, the magnetized leads will automatically align with their corresponding, complementarily magnetized traces. Col. 4, line 69, to col. 5, line 7.

Once the leads of the semiconductor device package are aligned with corresponding traces or terminals on the circuit board, the leads may be secured and electrically connected to their corresponding traces or terminals by known processes, such as by thermocompression bonding. Col. 2, lines 47-59.

(3) Analysis

Independent claim 1 is drawn to a method for establishing an electrical contact with at least one semiconductor device. Electrical contact is established in accordance with independent claim 1 by drawing the first member toward the contact.

While Butherus describes that leads of a packaged semiconductor device may be magnetically attracted to corresponding traces or terminals of a circuit board, the description of Butherus is limited to use of such magnetic attraction for the purpose of aligning the leads with

their corresponding traces or terminals. Butherus lacks any express or inherent description that the attraction of the leads to magnetic traces or terminals is sufficient to electrically connect the leads to the magnetic traces or terminals. To this end, Butherus describes that thermocompression bonding is necessary to secure the leads to their corresponding magnetic traces or terminals and, thus, to establish electrical contact between each lead and its corresponding magnetic trace or terminal. Col. 2, lines 47-59.

It is, therefore, respectfully submitted that Butherus does not and cannot anticipate, either expressly or inherently, each and every element of independent claim 1 in identical detail to that recited in independent claim 1, as is required to maintain a rejection under 35 U.S.C. § 102(b). Accordingly, it is respectfully submitted that, under 35 U.S.C. § 102(b), independent claim 1 recites subject matter which is allowable over that described in Butherus.

Claims 2-7 are each allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 4 is further allowable since each of the electrical connectors of Butherus, which are presumed to be the leads of the packaged semiconductor device, comprises only a single element. Thus, Butherus includes no express or inherent description of both “drawing [a] first member” of an electrical connector “toward [a] contact” (*see* independent claim 1) and “positioning a second member of the electrical connector opposite the first member,” as are required by claim 4.

Claim 5 depends directly from claim 4 and is also allowable because Butherus neither expressly nor inherently describes that oppositely positioned first and second members of an

electrical connector may be magnetically attracted to one another. Instead, the description of Butherus is limited to magnetically attracting a single-element lead directly to a trace or terminal.

Claim 6, which also depends directly from claim 4, is additionally allowable because Butherus does not expressly or inherently describe securing both first and second members of an electrical connector to a substrate by attracting at least the first member of the electrical connector to a contact carried by the substrate. Rather, Butherus merely describes attracting single-element leads to corresponding magnetic traces or terminals.

For these reasons, it is respectfully requested that the 35 U.S.C. § 102(b) rejections of claims 1-7 be withdrawn and that each of these claims be allowed.

(C) Rejections Under 35 U.S.C. § 103(a)

Claims 8, 9, and 11-20 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over the subject matter taught in Butherus, in view of the official notice that the Examiner has taken.

(1) Legal Authority

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference

(or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

(2) Additional Art Relied Upon

Official Notice

The Office has taken official notice of two teachings. First, the Office has taken official notice that “it is well known in the art to provide ground and power to electronic components to energize them.” Final Office Action dated January 14, 2004, page 3. Second, the Office has taken official notice that, “during burn-in testing[,] [sic] heat is provide[d] [sic] either cyclically or variously to purposely fail the [burned-in] component.” *Id.*

(3) Analysis

It is respectfully submitted that a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been established against any of claims 8, 9, or 11-20.

First, it is respectfully submitted that Butherus does not teach or suggest each and every claim limitation set forth in any of claims 8, 9, or 11-20, and the subject matter for which official notice has been taken does not remedy the deficiencies of Butherus.

Independent claim 8 recites a method for stress testing a plurality of semiconductor devices that are carried upon a common substrate and that are in communication with common ground and power contacts. The method of independent claim 8 includes establishing electrical contact between a first member of an electrical connector and at least one common contact, with

at least one of the first member and the at least one common contact being drawn toward the other.

It is respectfully submitted that Butherus lacks any teaching or suggestion that one of a first member of an electrical connector and a contact may be drawn to the other to establish an electrical connection therebetween. Rather, the teachings of Butherus are limited to generating a sufficient magnetic field to properly align leads of a packaged semiconductor device with corresponding traces or terminals of a circuit board. *See, e.g.*, Col. 4, line 69, to col. 5, line 7. Butherus teaches that, once the leads have been magnetically aligned with their corresponding traces or terminals, thermocompression bonding is required to secure and electrically connect each lead to its corresponding trace or terminal. Col. 2, lines 47-59.

Moreover, Butherus does not teach or suggest that electrical contact may be established between a first member of an electrical connector and a contact, such as a power contact or a ground contact, which is *common to* a plurality of semiconductor devices. Nor has the Examiner cited any art which teaches or suggests that electrical contact may be established between a first member of an electrical connector and a contact which is common to a plurality of semiconductor devices during stress testing.

Second, it is respectfully submitted that one of ordinary skill in the art would have no reason to expect that modifications of the teachings of Butherus in the manner that the Examiner has asserted would be successful. The mere fact that electrical connections are made during stress testing does not inherently, or necessarily, lead to the conclusion, asserted by the Examiner, that magnetic attraction of the type taught in Butherus would be adequate for

establishing electrical connections that will withstand stress testing conditions. Nor would one of ordinary skill in the art have any reason to expect that the type of magnetic attraction taught in Butherus, *i.e.*, alignment of leads with corresponding traces or contacts, could be successfully used to establish electrical connections that will withstand stress testing conditions.

Because Butherus does not teach or suggest that magnetic forces may be used to establish electrical contact, particularly during stress testing, it appears that the disclosure of the '743 Application provides the only source of motivation for one of ordinary skill in the art to modify the teachings of Butherus in the asserted manner. Thus, the Examiner has apparently improperly relied on the hindsight provided by the disclosure of the '743 Application in establishing his 35 U.S.C. § 103(a) rejection of independent claim 8.

In view of the foregoing, it is respectfully submitted that the Office has not established a *prima facie* case of obviousness against independent claim 8. Accordingly, it is respectfully submitted that, under 35 U.S.C. § 103(a), independent claim 8 is allowable over both the teachings of Butherus and the teachings for which the Office has taken official notice.

Each of claims 9 and 11-20 is allowable, among other reasons, for depending either directly or indirectly from claim 8, which is allowable.

Claim 11 is further allowable since each of the electrical connectors of Butherus, which are presumed to be the leads of the packaged semiconductor device, comprises only a single element. Thus, Butherus includes no teaching or suggestion of both "drawing the first member" of an electrical connector "toward . . . at least one contact" (*see* independent claim 8) and

“positioning a second member of the electrical connector opposite the first member,” as are required by claim 11.

Claim 12 depends directly from claim 11 and is also allowable because Butherus neither teaches nor suggests that oppositely positioned first and second members of an electrical connector may be drawn to one another. Instead, the teachings or suggestions of Butherus are limited to attracting a single-element lead directly to a trace or terminal.

Claim 13, which depends directly from claim 12, is additionally allowable because Butherus includes no teaching or suggest that first and second members of an electrical connector may be magnetically attracted to one another.

Claim 15 is further allowable since Butherus does not teach or suggest *securing* a first member of an electrical connector to a contact. Rather, Butherus merely teaches attracting single-element leads to corresponding magnetic traces or terminals. Securing of the leads to the traces or terminals is then effected by conventional bonding techniques, such as thermocompression. Col. 2, lines 47-59.

In view of the foregoing, reversal of the 35 U.S.C. § 103(a) rejections of claims 8, 9, and 11-20 is respectfully requested.

(9) APPENDIX

A copy of claims 1-20 is included herewith as the “Appendix.”

(10) CONCLUSIONS

It is respectfully submitted that:

(A) Claims 1-20 are allowable under 35 U.S.C. § 101 for reciting subject matter which differs in scope from the subject matter recited in claims 1-20 of the '738 Application;

(B) Claims 1-7 are allowable under 35 U.S.C. § 102(b) for being directed to subject matter which is novel over the subject matter disclosed in Butherus; and

(C) Claims 8, 9, and 11-20 are directed to subject matter that, under 35 U.S.C. § 103(a), is patentable over the subject matter taught in Butherus in view of "official notice" that has been taken by the Examiner.

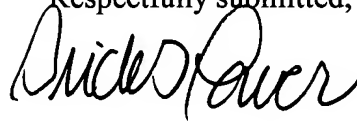
Further, as independent claim 8 is allowable, it is further requested that claim 10, which has been withdrawn from consideration as reading on a nonelected species, be allowed.

M.P.E.P. § 806.04(d).

Serial No. 10/044,743

Accordingly, reversal of the rejections of claims 1-20 and allowance of each of these claims are respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Brick G. Power". The signature is fluid and cursive, with the first name "Brick" being more prominent.

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Serial No. 10/044,743

APPENDIX

CLAIMS

1. A method for establishing an electrical contact with at least one semiconductor device, comprising:
establishing an electrical contact between a first member of an electrical connector and a contact that is in electrical communication with the at least one semiconductor device; and
drawing the first member toward the contact.
2. The method of claim 1, wherein the drawing is effected in a direction substantially normal to a plane of the contact.
3. The method of claim 1, wherein the drawing is effected in a direction substantially normal to a plane of a substrate upon which the contact is carried.
4. The method of claim 1, wherein the drawing is effected by positioning a second member of the electrical connector opposite the first member.
5. The method of claim 4, wherein the drawing is effected by magnetically attracting at least one of the first member and the second member toward at least the other of the first member and the second member.

6. The method of claim 4, wherein the drawing comprises securing the first and second members to a substrate upon which the contact is carried.
7. The method of claim 1, wherein the drawing comprises magnetically attracting the first member against the contact.
8. A method for stress testing a plurality of semiconductor devices carried upon a common substrate and in communication with common ground and power contacts, comprising:
establishing electrical contact between a first member of an electrical connector and at least one contact of the ground contact and the power contact; and
drawing the first member toward the at least one contact.
9. The method of claim 8, wherein the drawing is effected in a direction substantially normal to a plane of the substrate.
10. (Withdrawn) The method of claim 8, wherein drawing nonrigidly biases the first member against the at least one contact.
11. The method of claim 8, wherein the drawing comprises positioning a second member of the electrical connector opposite the substrate from the first member.

12. The method of claim 11, wherein at least one of the first member and the second member is drawn toward at least the other of the first member and the second member.

13. The method of claim 12, wherein the drawing comprises magnetically attracting at least one of the first member and the second member toward at least the other of the first member and the second member.

14. The method of claim 8, wherein the drawing comprises magnetically attracting the first member against the at least one contact.

15. The method of claim 8, wherein the drawing comprises securing at least the first member in position relative to the substrate.

16. The method of claim 8, further comprising:
electrically connecting another first member of another electrical connector to another of the
ground contact and the power contact; and
drawing the another first member toward the another contact.

17. The method of claim 16, further comprising:
applying a substantially constant amount of current to each semiconductor device of the plurality
of semiconductor devices through the first member and the another first member.

18. The method of claim 17, further comprising:
heating each of the plurality of semiconductor devices.

19. The method of claim 18, wherein the heating comprises cycling a temperature of
each of the plurality of semiconductor devices.

20. The method of claim 18, wherein the heating comprises varying a temperature of
each of the plurality of semiconductor devices.